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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/606,965

06/27/2003

Gan Lin Hwang

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EXAMINER

HENDRICKSON, STUART L

ART UNIT

PAPER NUMBER

1754

MAIL DATE

DELIVERY MODE

05/08/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/606,965	Applicant(s) HWANG, GAN LIN	
	Examiner Stuart Hendrickson	Art Unit 1754	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 April 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,5-11,14-16,19-21 and 24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,5-10,14,15,19,20 and 24 is/are rejected.
- 7) ☒ Claim(s) 2, 11, 16, 21 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1, 5-10, 14-15, 19-20 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lieber 6,159,742 taken with Uchida et al. 5560898.

As to the independent claims, Lieber '742 discloses a carbon nanotube (see column 1, lines 39-41) having an organic functionalization (see column 1, lines 48-67). The formula disclosed is:

$X-(L-M)_n$, wherein L-M is deemed to meet the limitation of an organic functional group.

Despite applicant's limitation of a nanocapsule, no difference is seen between the nanocapsule of the present invention and the nanotube of Lieber. Finally, the nanotubes are hollow (see column 2, line 24). Lieber does not discuss the purity, however Uchida teaches purifying nanotubes. It would have been obvious to one of ordinary skill in the art at the time of the invention to purify the nanotubes of Lieber because doing so provides for a high-sensitivity device without interfering species.

As to claim 5, Lieber '742 discloses a multi-walled carbon nanotube (see column 2, lines 33-39) with a diameter of 1-200 nm (see column 2, lines 24-26). In the carbon nanotube formula, n is 1 to 100 (see column 1, line 55).

Lieber teaches claim 6 because of the various possible combinations (see column 4, lines 25-40). In so far as the formula for Lieber does not match up to the present formula, it would have been obvious to provide bigger linking groups to be able to sorb more complicated molecules having many binding sites.

As to claims 7-9, these are process limitations and do not limit a product. No difference is seen. See, e.g., In re Brown, 459 F.2d 531, 173 U.S.P.Q. 685 (CCPA 1972); In re Fessman, 489 F.2d 742, 180 U.S.P.Q. 324 (CCPA 1974).

As to claim 10 and 14, Lieber teaches the functional groups of hydroxy (see column 4, lines 8-9), carboxylic acid (see column 4, lines 27-29), aldehydes and ketones (see column 4, lines 34-36). As explained above, Lieber '742 discloses a multi-walled carbon nanotube (see

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column 2, lines 33-39) with a diameter of 1-200 nm (see column 2, lines 24-26). In the carbon nanotube formula, n is 1 to 100 (see column 1, line 55).

As to claim 15 and 19, Lieber teaches the functional groups of amides (see column 4, lines 31-34, see also column 4, lines 1-3). Lieber '742 discloses a multi-walled carbon nanotube (see column 2, lines 33-39) with a diameter of 1-200 nm (see column 2, lines 24-26). In the carbon nanotube formula, n is 1 to 100 (see column 1, line 55).

As to claim 20 and 24, Lieber teaches the functional group of hydroxy (see column 4, line 8-9). Lieber '742 discloses a multi-walled carbon nanotube (see column 2, lines 33-39) with a diameter of 1-200 nm (see column 2, lines 24-26). In the carbon nanotube formula, n is 1 to 100 (see column 1, line 55).

Claims 1, 5-10, 15, 19, 20 and 24 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Hiura et al. 5698175.

The discussion above concerning the similarity of the carbon is incorporated herein. Hiura teaches purifying and functionalizing hollow nanotubes. The functional groups are recited. See col. 2-3, the figures and the examples. Even though the purity is not reported per se, no patentable difference is seen since Hiura performs essentially the same process on essentially the same material and seeks to purify. Hollow multiwall nanotubes are depicted; no differences are seen in the diameter or structure.

Applicant's arguments filed 4/9/07 have been fully considered but they are not persuasive.

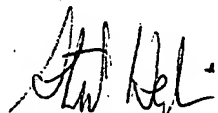
No differences have been demonstrated between the nanotubes of the references versus the capsules; the aspect ratio is not recited, nor do the claims limit where the functionalization occurs. The aggregation properties are not claimed or demonstrated to be different. There are no electron micrographs for a comparison to known materials. The argument that nanotubes are reactive at the ends is believed due more to the strain of the hemispherical caps rather than to agglomeration. The last table entry is illogical; the purity per se does not dictate the use.

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THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication should be directed to examiner Hendrickson at telephone number (571) 272-1351.

A handwritten signature in black ink, appearing to read 'Stuart Hendrickson', is positioned above the printed name.

Stuart Hendrickson
examiner Art Unit 1754